

SMALL TYPE PHOTOTRANSISTOR

DESCRIPTION

PH110 is a small type high sensitivity phototransistor molded with black resin. By using resin with a property of visible light cutting filter, the light receiving sensitivity of the device becomes active from a wavelength of approx. 820 nm, and the device is not affected by an external light such as a fluorescent lamp.

Since the device is housed in a small package with a lens, when it is used along with an infrared ray LED SE310 in the same shape, an intermediate distance photoelectric switch can be formed.

FEATURES

- High sensitivity ($I_c = 400 \mu A$ typ., $H = 50 \mu W/cm^2$)
- High spectral sensitivity (Sensitivity active wavelength: 820 nm TYP.)

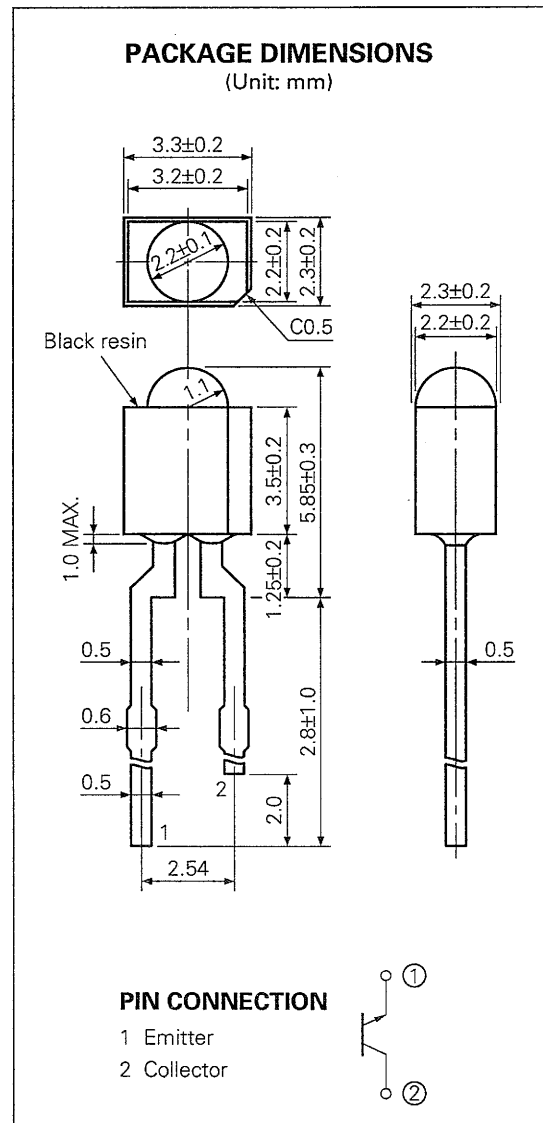
QUALITY GRADE

Standard

Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

APPLICATIONS

- Light receiving device of photoelectric touch panel
- Light receiving device of FDD, etc.



ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Collector to Emitter Voltage	V _{CEO}	30	V
Collector Current	I _c	40	mA
Collector Dissipation	P _c	100	mW
Junction Temperature	T _j	100	°C
Operating Temperature	T _{opt}	-30 to +85	°C
Storage Temperature	T _{stg}	-40 to +100	°C

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Dark Current	I _{CEO}			100	nA	V _{CE} = 10 V, H ^{*1} = 0 μW/cm ²
Collector Saturation Voltage	V _{CE(sat)}			0.3	V	I _c = 200 μA, H ^{*1} = 500 μW/cm ²
Photo Current*2	I _L	200	400		μA	V _{CE} = 5 V, H ^{*1} = 50 μW/cm ²
Rise Time – Fall Time	t _r , t _f		20		μs	V _{CC} = 10 V, H ^{*1} = 50 μW/cm ² R _L = 1 kΩ

*1 With infrared ray of peak light emitting wavelength λ_P = 940 nm

*2 I_L rank

- K : 200 to (μA)
- L : 200 to 600 (μA)
- M : 400 to 1 000 (μA)

TYPICAL CHARACTERISTICS (T_a = 25 °C)

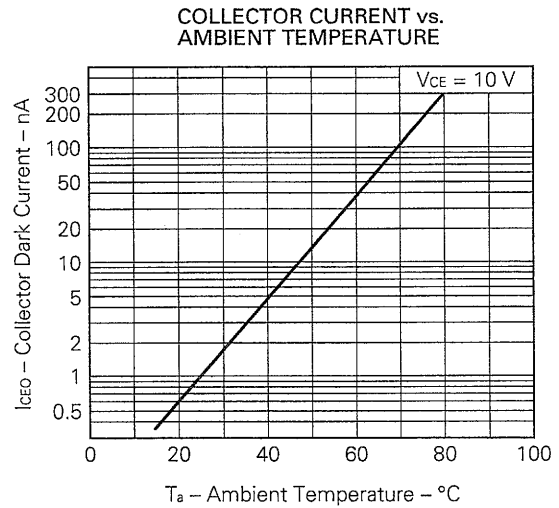
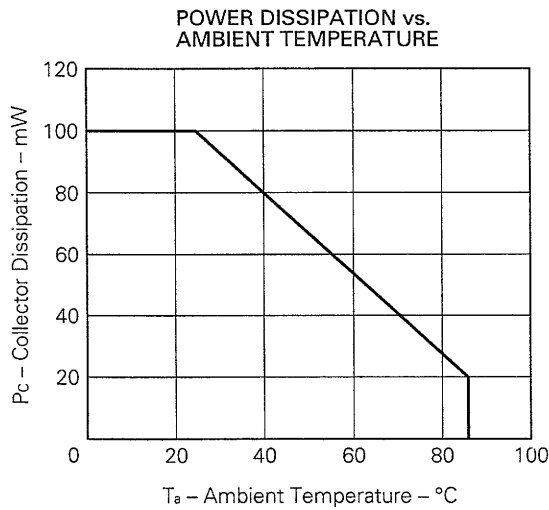
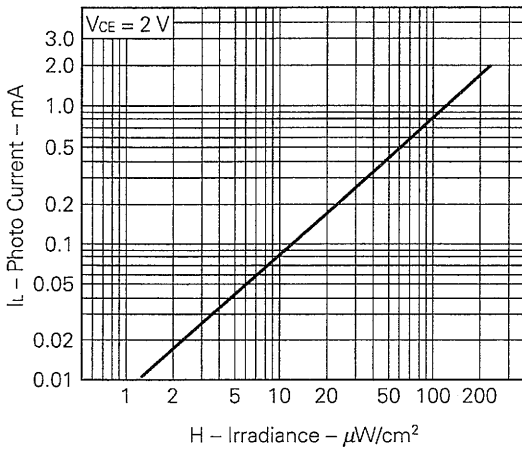
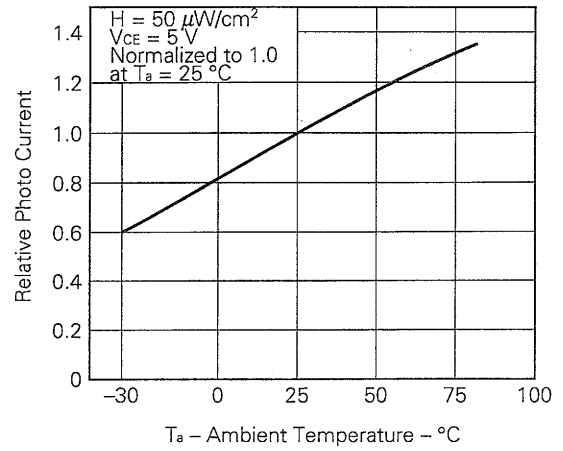


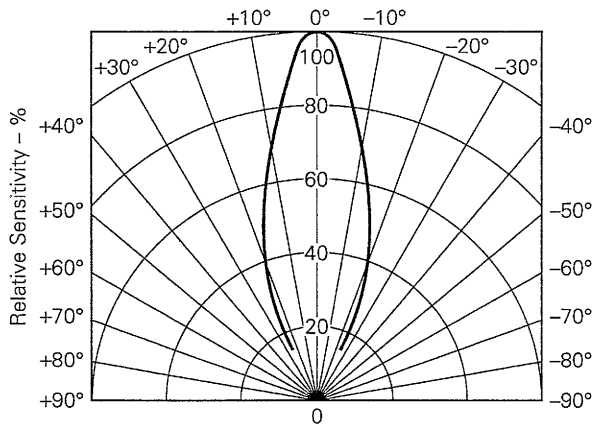
PHOTO CURRENT vs. IRRADIANCE



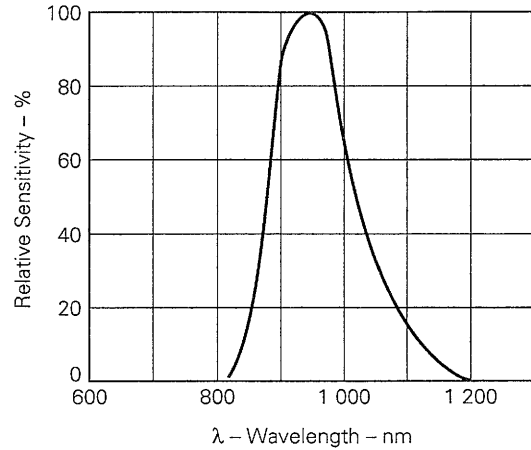
RELATIVE PHOTO CURRENT vs. AMBIENT TEMPERATURE



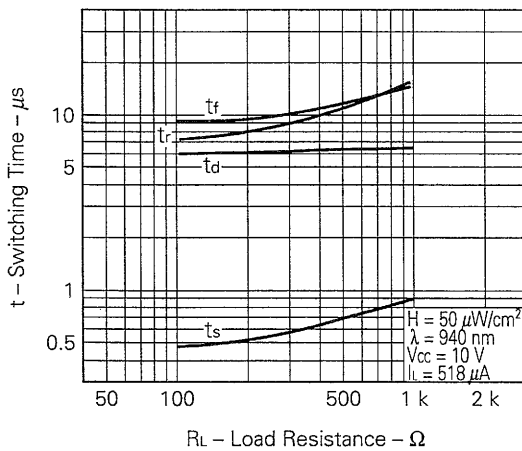
SPATIAL DISTRIBUTION



SPECTRAL RESPONSE



SWITCHING TIME vs. LOAD RESISTANCE



HANDLING PRECAUTIONS:**• Soldering**

The full resin-molded PH110 have generally a little mechanical and thermal strength than other resin-molded semiconductor devices as they have less additives. Therefore please note on the following points.

- (a) Soldering of leads should be made at the point 2 mm or more from the root of the case at 260 °C and within 5 s.
 - (b) Please keep the package temperature less than 100 °C.
 - (c) If the temperature of the molded portion rises in addition to the residual stress between the lead, the possibility that open or short circuit occurs due to the deformation or destruction of the resin will increase.
- On cleaning the device:
- (a) Cleaning with unsuitable solvent may impair the resin of the package and the following solvents should be used at the temperature of less than 45 °C and for less than 3 minutes of immersion time.
Ethanol, Methanol, Isopropyl-alcohol
 - (b) Ultrasonic cleaning will add some stress on devices. The degree of the stress differs depending on the oscillation output power, the size of the PCB and the mounting methods of the devices, therefore it should be confirmed by making an experiment at actual conditions that the cleaning does not have any problem on the devices.

[MEMO]

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Application examples recommended by NEC Corporation.

Standard: Computer, Office equipment, Communication equipment, Test and Measurement equipment, Machine tools, Industrial robots, Audio and Visual equipment, Other consumer products, etc.

Special: Automotive and Transportation equipment, Traffic control systems, Antidisaster systems, Anticrime systems, etc.